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- Bass, Mark  
Naples, Florida 34109 (US)
- Fogt, James Franklin  
Sidney, Ohio 45365 (US)
- Huddleston, Jeffrey Andrew  
Sidney, Ohio 45365 (US)

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(71) Applicant: Copeland Corporation  
Sidney, Ohio 45365-0669 (US)

(74) Representative: Price, Nigel John King  
J.A. KEMP & CO.  
14 South Square  
Gray's Inn  
London WC1R 5JJ (GB)

(72) Inventors:  
• Doecker, Roy Joseph  
Lima, Ohio 45806 (US)

## (54) Scroll compressor capacity control

(57) A scroll compressor includes a capacity modulation system. The capacity modulation system has a piston that is connected to the non-orbiting scroll that disengages the non-orbiting scroll from the orbiting scroll when a pressure chamber is placed in communication with the suction chamber of the compressor. The non-orbiting scroll member moves into engagement with the orbiting scroll when the chamber is placed in communication with the discharge chamber. The engagement between the two scrolls is broken when the pressure chamber is placed in communication with fluid from the suction chamber. A solenoid valve controls the communication between the pressure chamber and the suction chamber. By operating the valve in a pulsed width modulated mode, the capacity of the compressor can be infinitely varied between zero and one hundred percent.

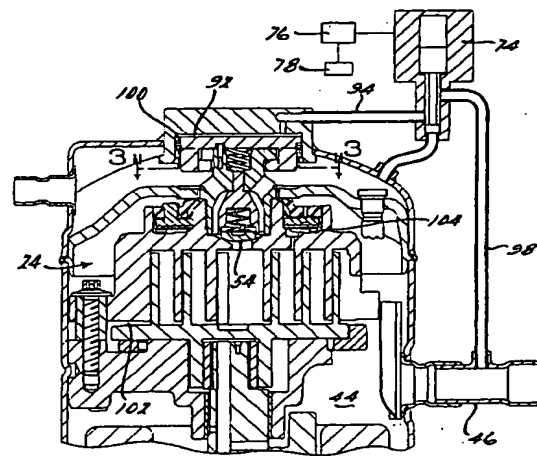


FIG. 1

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## EUROPEAN SEARCH REPORT

Application Number  
EP 00 30 8176

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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Y	* column 1, line 33 - line 38 *	15, 20-23, 27	
A	* column 1, line 53 - line 59 *	18, 19, 29-31	
	* column 7, line 14 - line 15 *		
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	* claims 2, 3, 7, 14-16 *		
	* figures 2, 20, 21, 26, 32 *		
Y	US 4 877 382 A (WEATHERSTON ROGER C ET AL) 31 October 1989 (1989-10-31)	15	
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A	* figure 3 *	30, 31	
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	* page 4, line 14-23 *		
		-/--	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 May 2002	Examiner Lequeux, F
CATEGORY OF CITED DOCUMENTS		1 : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			



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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

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EUROPEAN SEARCH REPORT

Application Number  
EP 00 30 8176

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		3 May 2002	Lequeux, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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LACK OF UNITY OF INVENTION  
SHEET B

Application Number  
EP 00 30 8176

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-19, 24-26, 29-30

scroll compressor with capacity regulation via a piston  
operated axial movement of one of the scrolls

2. Claims: 20-31

scroll compressor with capacity regulation via a fluid  
injection system

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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